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a pair of domain control layers extending over the surface of the fundamental layer so as to interpose the magnetoresistive film along the fundamental layer;

an upper shield layer opposed to the magnetoresistive film at a first interface, said upper shield layer opposed to the domain control layers at second interfaces; and

at least one groove formed on said upper shield layer so as to isolate the first and second interfaces from each other.

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### REMARKS

As a preliminary matter, Applicants request acknowledgement of the claim for priority made under 35 U.S.C. § 119 based on Japanese Patent Application No. 2000-377033, filed December 12, 2000.

Claims 1-10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ishi (U.S. Patent No. 5,800,935). Applicants respectfully traverse the rejection because Fig. 1 of the Ishi reference does not disclose an upper shield layer having first and second interfaces extending over a common datum plane.

The Ishi reference discloses in Fig. 1 a MR layer 6 and lead layers 8 that have a non-magnetic gap layer 3b deposited thereon. A shield layer 2b is positioned on the non-magnetic gap layer 3b. In the Office Action, the Examiner identifies interfaces  $I_1$  and  $I_2$  as corresponding to different datum planes as defined in the present invention or relative heights of the interfaces as viewed in Fig. 1 of the cited reference.

Applicants' claim 1 calls for, among other things, an upper shield layer that has a first interface extending over a datum plane and a second interface that extends over the datum plane. As best seen in Fig. 5 of the present Application, the first and second interfaces 52 and 53 are designed to extend within a common single datum plane 51 (see the Specification, page 15, lines 29-31). Such a datum plane in Fig. 1 of the reference would pass through the shield layer 2b, as well as the non-magnetic gap layer 3b. Since Fig. 1 of the Ishi reference does not disclose the datum plane of claim 1, and claims 2-10 depend either directly or indirectly from claim 1, Applicants request withdrawal of the rejection to claims 1-10.

Claims 11-16 stand rejected under 35 U.S.C. § 103(a) as being obvious over Ishi in view of Saito (U.S. Patent No. 6,343,022), and further in view of Saito (U.S. Patent No. 6,094,328). Applicants respectfully traverse the rejection with respect to claim 11 because the cited references do not disclose or suggest a magnetoresistive transducer having a product between the height of a raised portion and a magnetization intensity of an upper shield layer that is set smaller than a product between a thickness and a magnetization intensity of a domain control layer. Applicants also traverse the rejection to claim 16 because the cited references do not disclose a magnetoresistive transducer having an upper shield layer covering at least a magnetoresistive film and which is magnetized in a reverse longitudinal direction opposite to a normal longitudinal direction.

Referring to claim 11, the Examiner indicates that the Ishi reference does not teach a product between a height of the raised portion in a magnetization intensity of the upper shield layer that is set smaller than a product between a thickness and a magnetization intensity of the domain control layer. However, the Examiner indicates that Saito '328 and Saito '022 can be combined with the Ishi reference to disclose the above product. But, Saito '328 does not disclose a product between a height of a raised portion in a magnetization intensity of the upper shield layer being set smaller than a product between a thickness and magnetization intensity of a domain control layer. Rather, Saito '328 discloses that the intensity of the magnetic anisotropy applied to the second magnetic layer, and not a portion of this layer, is proportional to the intensity of residual magnetism or the thickness of the hard magnetic layers (col. 2, lns. 64-68). Saito '022 also does not disclose or suggest the above product relationship. The suggestion by the Examiner that such a product relationship can be derived from the cited references is impermissible hindsight. Since the cited references alone or in combination fail to disclose the above product relationship, Applicants believe that claim 11 is allowable and request withdrawal of the § 103(a) rejection to claim 11. Claims 12-15 are indirectly or directly dependent from claim 11, and are considered allowable for the reasons stated with respect to the rejection of claim 11.

Referring to claim 16, the Examiner states that the Ishi reference does not teach an upper shield layer magnetized in a reverse longitudinal direction opposite to the normal

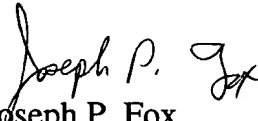
longitudinal direction. The Examiner indicates that Fig. 2 of the Saito '022 reference shows a magnetoresistive transducer wherein a shield bias magnetic field S2 from the upper shield layer flows in a direction opposite to the magnetic field Hbf1 across the magnetoresistive film. However, Fig. 2 is directed to the magnetized directions of layers included in a multi-layered giant magnetoresistive film. In Fig. 2, the Saito '022 reference discloses an application of various magnetic fields that are applied to a free magnetic layer 20. Interlayer coupling magnetic fields Hbf1 and Hbf2 are applied to the free magnetic layer 20. A sensing electric current 36 flows from lead layers 35 and 35 of Fig. 1 through non-magnetic layers 23 and 24 to provide induction magnetic fields  $Is_1$  and  $Is_2$ . Under the influence of the induction magnetic fields  $Is_1$  and  $Is_2$  by the sensing electric current 36, a shield bias magnetic layer S1 and a shield bias magnetic layer S2 are applied to the free magnetic layer 20. (See col. 18, ln. 26 to col. 19, ln. 16). Saito '022 does not disclose or suggest an upper shield layer magnetized in a reverse longitudinal direction opposite to the normal longitudinal direction. Therefore, Applicants consider claim 16 to be in condition for allowance, and withdrawal of the § 103(a) rejection is respectfully requested.

Applicants have added new claim 17 directed to a magnetoresistive transducer which calls for, among other things, a groove formed on the upper shield layer so as to isolate the first and second interfaces from each other. Support for this amendment can be found on page 16 of the Specification.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached Appendix is captioned "Version with Markings to Show Changes Made."

Applicants submit that this Application is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite the prosecution.

Respectfully submitted,  
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**VERSION WITH MARKINGS TO SHOW CHANGES MADE****In the Claims:**

New claim 17 has been added as follows:

17. (New) A magnetoresistive transducer comprising:

a magnetoresistive film extending over a surface of a fundamental layer;

a pair of domain control layers extending over the surface of the fundamental

layer so as to interpose the magnetoresistive film along the fundamental layer;

an upper shield layer opposed to the magnetoresistive film at a first interface,

said upper shield layer opposed to the domain control layers at second interfaces; and

at least one groove formed on said upper shield layer so as to isolate the first

and second interfaces from each other.